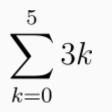
CSE 191 Recitation

4/10/23 - 4/14/23 - Summations, Recurrence, and Induction

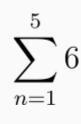


Summations

Compute the following summations



 $\sum_{i=4}^{9} (i-3)$



 $\sum_{i=1}^{3} \sum_{j=2}^{4} ij$

Let $a_n = 3n + 4$ 5 a_n n=1

Recurrence Relations

Let $\{a_n\}$ be the sequence defined by the recurrence relation: $a_0 = 0$, $a_1 = 2$, $a_n = 2a_{n-2} - 2$ List out the first 10 terms of the sequence that satisfies this recurrence relation Find an explicit formula for the nth term of this recurrence relation

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$$a_n = \begin{cases} -2(2^{n/2} - 1) & \text{if } n \text{ is even} \\ 2 & \text{if } n \text{ is odd} \end{cases}$$

Induction

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- 1. Express the statement being proved in the form " $\forall n \ge b$, P(n) for a fixed integer b
- 2. Prove the **Base Case**: show that **P(b)** is true.
- 3. Prove the **Inductive Case**
 - a. State the inductive hypothesis in the form "assume that P(k) is true for an arbitrary $k \ge b$
 - b. State what must be proved under this assumption; write out P(k + 1)
 - c. Prove the statement P(k + 1) is true by using the assumption P(k) is true. Be sure this proof is valid for all integers $k \ge b$
 - d. Clearly identify the conclusion
- Now that you have proven the Base Case and Inductive Case, conclude that *P(n)* is true for all *n* ≥ *b*